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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/814,347	04/01/2004	Toshiya Fujii	60188-828	5326

7590 10/05/2007  
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Washington, DC 20005-3096

EXAMINER
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LAM, HUNG H

ART UNIT	PAPER NUMBER
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2622

MAIL DATE	DELIVERY MODE
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10/05/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

Application No.

10/814,347

Applicant(s)

FUJII ET AL.

Examiner

Hung H. Lam

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 04/01/04.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 18-20 is/are allowed.
- 6) ☒ Claim(s) 1-7 and 17 is/are rejected.
- 7) ☒ Claim(s) 8-16 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 January 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- |                                                                                        |                                                                   |
|----------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____                                                            | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Priority*

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### *Specification*

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

### *Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-3 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morinaka (US-2003/0,133,028) in view of Fujiwara (US-6,583,809).

With regarding **claim 1**, Morinaka discloses a solid-state color imaging apparatus comprising:

a solid-state imaging device including a plurality of photoelectric converters arranged in an array and color filters attached to front faces of the respective photoelectric converters (Fig. 1-2; images sensing element 10 and color filter 11), the color filters being repeatedly arranged in two dimensions,  $p \times q$  pixels (where  $p$  is a natural number and  $q$  is a natural number) in the solid-state imaging device in which  $p$  pixels are arranged in a horizontal direction and  $q$  pixels are arranged in a vertical direction forming a basic unit of a pixel adding area (see Figs. 6 and 10; [0029; 0035-0037]);

means configured to have an arrangement in which all the basic units of the pixel adding area are repeatedly arranged in two dimensions ([0029; 0035-0037]); and

means for adding together all the pixels corresponding to part of the color filters for the same color in each of the basic units of the pixel adding area (abstract; [0028-0035]).

However, Morinaka fails to explicitly disclose that all the basic units of the pixel adding area are repeatedly arranged in two dimensions being shifted from each other in the horizontal and vertical directions and overlapping with each other.

In the same field of endeavor, Fujiwara teaches an image-sensing device wherein pixels are shifted when a high-resolution image is formed or transferred. Fujiwara further teaches that high-resolution image may be performed by a shift equivalent to half a pixel and is not limited to shift by an amount equivalent to one pixel pitch (Col. 13, Ln. 47-60). In light of the teaching from Fujiwara, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify

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the device of Morinaka to shift pixels by  $\frac{1}{2}$  pixels or 1 pixel pitch in order to obtain high-resolution image. The modifications thus improve an image viewing-area.

With regarding **claim 2**, Morinaka in view of Fujiwara discloses the solid-state color imaging apparatus of claim 1, wherein all the pixels in an effective area of the solid-state imaging device are subjected to the pixel addition(Morinaka: abstract; [0028-0035]).

With regarding **claim 3**, Morinaka in view of Fujiwara discloses the solid-state color imaging apparatus of claim 1, wherein the basic units of the pixel adding area overlap with each other such that the resultant pixels reduced in number and obtained by the pixel addition are regularly arranged (Morinaka: see Figs. 7 and 11; [0030-0032; 0035-0037]).

With regarding **claim 17**, Morinaka in view of Fujiwara discloses the solid-state color imaging apparatus of claim 1, further comprising means for switching (Fig. 1; switch 15) an output from the solid-state imaging device between an output in which pixels are added together and an output in which all the pixels are independent of each other ([0022; 0025; 0028-0037]).

*Allowable Subject Matter*

5. Claims 18-20 are allowable.

6. Claims 4, 8 and 11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reason for the indication of allowance:

Regarding claim 4 the prior art made of record and considered pertinent to the applicant's disclosure does not disclose nor fairly suggest the solid-state color imaging apparatus of claim 1 further in combination with: **wherein the color filters are repeatedly arranged in two dimensions such that two rows and two columns constitute one unit of the color filter arrangement,  $p \times q$  pixels (where  $p=4n+1$ ,  $n$  is a natural number,  $q=4m+1$  and  $m$  is a natural number) in the solid-state imaging device form a basic unit of the pixel adding area, all the basic units of the pixel adding area are repeatedly arranged in two dimensions, being shifted from each other by  $(p+1)/2$  pixels in the horizontal direction and by  $(q+1)/2$  pixels in the vertical direction and overlapping with each other, and a pixel corresponding to one of the color filters located at the center of each of the basic units in both the horizontal and vertical directions and pixels corresponding to part of the color filters for the same color located apart from the color filter located at the center by even numbers of rows and columns are added together in each of the basic units of the pixel adding area.**

Regarding claim 8 the prior art made of record and considered pertinent to the applicant's disclosure does not disclose nor fairly suggest the solid-state color imaging apparatus of claim 1 further in combination with: **wherein the color filters are repeatedly arranged in two dimensions in the manner that, if one direction is defined as a row and another direction perpendicular to said direction is defined as a column, four rows and two columns form one unit of the color filter arrangement, one of the color filters at the first row and the first column and one of the color filters at the third row and the second column are for the same color, one of the color filters at the first row and the second column and one of the color filters at the third row and the first column are for the same color, one of the color filters at the second row and the first column and one of the color filters at the fourth row and the second column are for the same color, and one of the color filters at the second row and the second column and one of the color filters at the fourth row and the first column are for the same color,  $p \times q$  pixels (where  $p=4n+2$ ,  $n$  is a natural number,  $q=4m+2$  and  $m$  is a natural number) in the solid-state imaging device form a basic unit of the pixel adding area, all the basic units of the pixel adding area are repeatedly arranged in two dimensions, being shifted from each other by  $p/2$  pixels in the horizontal direction and by  $q/2$  pixels in the vertical direction and overlapping with from each other, and all the pixels corresponding to part of the color filters for a color represented by the pixel at the first row and the first column, the first row and the second column, the second row and the first column or the second row and the second column in**

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each of the basic units of the pixel adding area in  $p$  rows and  $q$  columns are added together in the same pattern in all the basic units of the pixel adding area, and the pixels for only one color are added together in each of the basic units of the pixel adding area.

Regarding claim 11 the prior art made of record and considered pertinent to the applicant's disclosure does not disclose nor fairly suggest the solid-state color imaging apparatus of claim 1 further in combination with: wherein the color filters are repeatedly arranged in two dimensions and two rows and two columns form one unit,  $p \times q$  pixels (where  $p=4n-1$ ,  $n$  is a natural number,  $q=4m-1$  and  $m$  is a natural number) in the solid-state imaging device form a basic unit of the pixel adding area, the basic unit of the pixel adding area is repeated in two dimensions, being shifted from one another by alternately  $(p-1)/2$  pixels and  $(p+3)/2$  pixels in the horizontal direction and by alternately  $(q-1)/2$  pixels and  $(q+3)/2$  pixels in the vertical direction and overlapping with one another, and all the pixels corresponding to part of the color filters located at the respective four corners in diagonal directions and corresponding to part of the color filters for the same color located apart from the pixels at the four corners by even numbers of rows and columns are added together in the basic unit of the pixel adding area.



With regarding claim 18, the prior art made of record and considered pertinent to the applicant's disclosure does not disclose nor fairly suggest a solid-state color imaging apparatus comprising:

a solid-state imaging device including a plurality of photoelectric converters arranged in an array and color filters attached to front faces of the respective photoelectric converters, the color filters being repeatedly arranged in two dimensions in the manner that, if one direction is defined as a row and another direction perpendicular to said direction is defined as a column, four rows and two columns form one unit of the color filter arrangement, one of the color filters at the first row and the first column and one of the color filters at the third row and the second column are for the same color, one of the color filters at the first row and the second column and one of the color filters at the third row and the first column are for the same color, one of the color filters at the second row and the first column and one of the color filters at the fourth row and the second column are for the same color and one of the color filters at the second row and the second column and one of the color filters at the fourth row and the first column are for the same color,  $p \times q$  pixels (where  $p=2n+2$ ,  $n$  is a natural number,  $q=2m+2$  and  $m$  is a natural number) in the solid-state imaging device in which  $p$  pixels are arranged in a horizontal direction and  $q$  pixels are arranged in a vertical direction forming one basic unit of a pixel adding area;

means for adding together all the pixels for a color represented by one of the color filters at the first row and the first column and one of the color filters at the third row and the second column in the unit of the color filter arrangement;

means for adding together all the pixels for a color represented by one of the color filters at the first row and the second column and one of the color filters at the third row and the first column in the unit of the color filter arrangement; means for adding all the pixels for a color represented by one of the color filters at the second row and the first column and one of the color filters at the fourth row and the second column in the unit of the color filter arrangement; and

means for adding all the pixels for a color represented by one of the color filters at the second row and the second column and one of the color filters at the fourth row and the first column in the unit of the color filter arrangement.

Regarding claims 5-7, 9-10 and 12-16, the claims are objected as being dependent of claims 4, 8 and 11, respectively.

Regarding claims 19-20, the claims are allowed as being dependent of claim 18.

### ***Conclusion***

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a) Morinaka (US-7,148,926) discloses an image sensing apparatus for adding pixels blocks.

b) Ikeda (US-2004/0,207,747) discloses an image-sensing device shifting pixels.

c) Sakata (US-6,678,000) discloses 1/3 pixel shifting to obtain high-resolution still image.

d) Watanabe (US-2006/8,227,225) discloses an imaging apparatus for adding and shifting pixels.

e) Komiya (US-2004/0,062,454) discloses an apparatus for summing and shifting pixel.


8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hung H. Lam whose telephone number is 571-272-7367. The examiner can normally be reached on Monday - Friday 8AM - 5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, LIN YE can be reached on 571-272-7372. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

HL  
09/30/07



LIN YE  
SUPERVISORY PATENT EXAMINER